

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY**

SMART VENT PRODUCTS, INC.,	:	
	:	
Plaintiff,	:	CIVIL ACTION NO.:
	:	1:10-cv-00168-JBS-KMW
	:	
	:	
USA FLOODAIR VENTS, LTD.	:	JURY TRIAL DEMANDED
	:	
Defendant.	:	

FIRST AMENDED COMPLAINT

COMES NOW, the Plaintiff, Smart Vent Products, Inc. (“SV Products”), by and through its undersigned counsel, and for its complaint against the Defendant, USA Floodair Vents, Ltd. (“USA Flood”) avers as follows:

PARTIES

1. SV Products is a corporation organized under the laws of the State of Florida with a principal place of business at 14255 U.S. Highway 1, Suite 235, Juno Beach, FL 33408.
2. USA Flood is a corporation organized under the laws of the State of New York with a principal place of business at 56 West Main Street, Kings Park, New York 11754.

JURISDICTION AND VENUE

3. This Court has jurisdiction over this matter pursuant to 28 U.S.C. § 1331 because this Complaint raises claims arising under the laws of the United States.
4. Venue is proper in this judicial district pursuant to 28 U.S.C. § 1391(b)(1) because USA Flood is deemed to reside in this judicial district as it is subject to personal jurisdiction in this judicial district pursuant to 28 U.S.C. § 1391(c) and pursuant to 28 U.S.C. § 1391(b)(2) because a substantial part of the events or omissions giving rise to the claims occurred within this judicial district.

FACTS

5. SV Products manufactures flood mitigation/ventilation systems in the form of foundation flood vents.

6. The purpose of these vents is to allow the flood waters to flow freely into and out of the lower level of structures. If water pressure were to build up on either the interior or exterior of foundation walls, in, for example, a flood situation, the foundation walls could be compromised and significant property damage could occur as a result.

7. USA Flood is in the business of selling and offering for sale, among other items, flood vents to be installed in the lower level of structures.

8. USA Flood competes with SV Products for consumers of flood vent products.

9. With the passage of the National Flood Insurance Act of 1968, the United States Congress established the National Flood Insurance Program (“NFIP”). The NFIP is a program of the federal government which enables property owners in participating communities to purchase flood insurance in exchange for State and community floodplain management regulations that seek to reduce future flood damage.

10. One of the important objectives of the NFIP is the protection of buildings that are constructed in special flood hazard areas (“SFHAs”) from damage caused by flood forces. In support of this objective, the NFIP regulations include minimum building design criteria that apply to new construction, repair of substantially damages buildings, and substantial improvement of existing buildings in SFHAs. Some of these requirements are set forth in the document “Openings in Foundation Walls and Walls of Enclosures,” FEMA Technical Bulletin 1, August 2008 (hereafter “TB-1”).

11. TB-1, as amended, requires that vents which are to be installed in foundation walls

and walls of enclosures meet certain criteria.

12. The flood vents manufactured and sold by SV Products meet the requirements of TB-1, as amended.

13. Under TB-1, as amended, “Engineered Openings” are “[o]penings designed and certified by a registered design professional as meeting the performance required by the regulations....”

14. When building designers or owners use unique or individually designed openings or devices, TB-1 requires that “a registered design professional must submit a certification.” Typically, the design professional submitting the certification must be licensed to practice in the State in which the building is located.

15. TB-1 requires that the certification must include certain information, including, but not limited to: (a) information about the design professional, his or her license, signature, and applied seal; (b) a statement certifying that the openings are designed to automatically equalize hydrostatic flood loads on exterior walls by allowing the automatic entry and exit of floodwaters in accordance with the design requirements of Engineered openings as set forth in the American Society of Civil Engineers (“ASCE”) standard *Flood Resistant Design and Construction* (ASCE 24), which is reference by the *International Building Code*; (c) a description of the range of flood characteristics tested or computed for which the certification is valid, such as rates of rise and fall of floodwaters; and (4) a description of the installation requirements or limitations that, if not followed, will void the certification.

16. USA Flood engages engineers who are licensed in different States to certify that its flood vents comply with the applicable requirements. The certificates of compliance by these engineers on behalf of USA Flood do not comply with the requirements of TB-1, as amended, or

the design and performance criteria for engineered openings specified in ASCE 24, including, without limitation, the installation requirements and a description of the additional flood characteristics, such as the maximum flow and rise rates, that the vents will handle.

17. On its website, and at a trade show in September, 2009, USA Flood advertises that its flood vents are “FEMA, ICC and NFIP State Engineered Certified Compliant vents.” See Exhibit A.

18. FEMA does not certify vents as compliant with its regulations.

19. The International Code Council (“ICC”) is the parent company of ICC Evaluation Services, Inc.

20. ICC Evaluation Services, Inc. will evaluate a product, such as flood vents, to determine if that product is compliant with a particular code. If the product is found to be compliant, ICC Evaluation Services, Inc. will issue a certification that the product is compliant with that particular code.

21. ICC Evaluation Services, Inc. has not, however, certified the flood vents sold by USA Flood as compliant with any code.

22. The flood vents offered for sale by USA Flood have not been certified in compliance with the NFIP regulations as set forth in TB-1, as amended.

COUNT I **PATENT INFRINGEMENT**

23. This Count is for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 271 *et. seq.*, to enjoin and obtain damages resulting from Defendant’s unauthorized manufacture, use, sale of and/or offer to sell products that infringe one or more claims of United States Patent No. 5,944,445 (“‘445 Patent”) attached as Exhibit B.

24. SV Products is the owner by assignment of the rights in the ‘445 Patent.

25. The claims of the '445 Patent are directed, in general, toward a device which relieves flood pressure from enclosed spaces.

26. Among other items, the invention disclosed in the '445 Patent allows for the rapid intake and evacuation of flood water in the enclosed spaces located below structures and dwellings.

27. In contravention of 35 U.S.C. § 271, and with knowledge of the '445 Patent, Defendant USA Flood has willfully and deliberately infringed the '445 Patent by making, using, selling and/or offering to sell products which infringe one or more claims of the '445 Patent.

28. Defendant's acts of infringement have occurred and continue to occur without the authority or license of SV Products.

29. Defendant's unlawful infringement has caused and will continue to cause damage to Plaintiff, and has caused and will continue to cause Plaintiff irreparable harm for which there is no adequate remedy at law, unless this Court enjoins Defendant's unlawful, infringing activity.

WHEREFORE, Plaintiff prays for a judgment against Defendant USA Flood and requests that this Court:

1. Enter a finding and judgment in favor of SV Products and against USA Flood for patent infringement and award compensatory damages to Plaintiff, together with pre-judgment and post-judgment interests and costs as provided by 35 U.S.C. § 284;
2. Enter an award of triple damages to Plaintiff for Defendant's willful infringement of the '445 Patent pursuant to 35 U.S.C. § 284;
3. Enter a preliminary and permanent injunction enjoining and restraining Defendant and its affiliates, subsidiaries, officers, directors, employees, agents, representatives, licensees, successors and assigns, and all those acting for and on their behalf, or acting in concert with them, from making, using, offering to sell and/or selling any product and/or service as falls within the scope of any claim of the '445 Patent pursuant to 35 U.S.C. § 283, and for all further and proper injunctive relief;

4. Enter a finding that this case is exceptional and an award of Plaintiff's costs and reasonable attorneys' fees under 35 U.S.C. § 285 or other applicable law; and
5. Such other relief, at law or in equity, as the Court deems just and proper.

COUNT II
UNFAIR COMPETITION, 15 U.S.C. § 1125

30. SV Products repeats and incorporates by reference the allegations made in the foregoing paragraphs of this Amended Complaint as if fully set forth herein.

31. This Count is for unfair competition and arises under the Lanham Act, 15 U.S.C. §§ 1051-1127 in general, and 15 U.S.C. § 1125(a)(1)(B) in particular.

32. USA Flood has engaged in various acts of unfair competition, including those that are forth in detail in this Amended Complaint. The false and/or misleading statements by USA Flood include the literally false statement made by USA Flood that its flood vents are "FEMA, ICC and NFIP State Engineered Certified Compliant vents."

33. USA Flood's conduct constitutes willful acts of unfair competition as USA Flood knows that this statement is false.

34. USA Flood has made this statement with the intent of influencing consumers to purchase its flood vents.

35. USA Flood's aforementioned statement is material in that it influences the purchasing decisions of consumers.

36. As a direct and proximate result of USA Flood's actions and statement, there is actual deception of the intended audience, namely, the consumers of the flood vents.

37. USA Flood's advertised goods, namely, the flood vents, traveled in interstate commerce.

38. SV Products has been injured as the direct and proximately result of USA Flood's acts complained of herein, and there is a likelihood of continued injury to SV Products as result of USA Flood's acts complained of herein.

WHEREFORE, Plaintiff prays for a judgment against Defendant USA Flood, and requests that this Court:

1. Award actual damages, incidental damages, and consequential damages as permitted by law, including punitive and treble damages, pursuant to 15 U.S.C. § 1117(b);
2. Award all of Defendant's profits or gains resulting from Defendant's willful acts of unfair competition as provided by 15 U.S.C. § 1117;
3. Award interest, attorneys' fees, costs and disbursements due to the exceptional nature of this case as provided by 15 U.S.C. § 1117;
4. Enjoin Defendant, its affiliates, subsidiaries, officers, directors, employees, agents, representatives, licensees, successors and assigns, and all those acting for and on their behalf, or acting in concert with them from further acts of unfair competition; and
5. Award all further and proper injunctive relief, and all such other relief as permitted by law that this Court deems appropriate.

COUNT III
UNFAIR COMPETITION, N.J.S.A. §§ 56:4-1 AND 56:4-2

39. SV Products repeats and incorporates by reference the allegations made in the foregoing paragraphs of this Amended Complaint as if fully set forth herein.

40. This Count is for unfair competition and arises under the New Jersey unfair competition statute, N.J.S.A. §§ 56:4-1 and 56:4-2.

41. USA Flood has engaged in various acts of unfair competition, including those that are forth in detail in this Amended Complaint. The acts of unfair competition include, but are not limited to, USA Flood's improper reliance on Certificates of Compliance relating to its flood vents that are false and misleading in that they do not comply with the design and performance criteria

for engineered openings as specified in TB-1, as amended, and ASCE 24. Further the acts of unfair competition include the literally false and misleading statements made by USA Flood that its flood vents are certified as compliant by FEMA, ICC and NFIP.

42. USA Flood's conduct constitutes willful acts of unfair competition as USA Flood at all times knew that its Certificates of Compliance and its statements concerning the certification of its products by FEMA, ICC, and NFIP are false and misleading.

43. USA Flood has made these false and misleading Certificates of Compliance and statements with the intent of influencing consumers to purchase its flood vents.

44. USA Flood's aforementioned Certificates of Compliance and statements are material in that they have influenced and continue to influence the purchasing decisions of consumers.

45. USA Flood intended to mislead the public for its own commercial gain with the aforementioned false and misleading Certificates of Compliance and statements, at the expense of and causing injury to SV Products, which did not engage in similar actions of unfair competition or make similar false and misleading statements.

46. As a direct and proximate result of USA Flood's false and misleading Certificates of Compliance and statements, there is actual deception or confusion, and/or the likelihood of deception or confusion, of the intended audience, namely, the consumers of the flood vents.

WHEREFORE, Plaintiff prays for a judgment against Defendant USA Flood and requests that this Court:

1. Award actual damages, incidental damages, and consequential damages as provided by N.J.S.A. § 56:4-2;
2. Award treble damages as provided by N.J.S.A. § 56:4-2 and punitive damages as permitted by law;

3. Award all of Defendant's profits or gains resulting from Defendant's willful acts of unfair competition;
4. Award interest, attorneys' fees, costs and disbursements as permitted by law;
5. Enjoin Defendant, its affiliates, subsidiaries, officers, directors, employees, agents, representatives, licensees, successors and assigns, and all those acting for and on their behalf, or acting in concert with them from further acts of unfair competition as provided by N.J.S.A. § 56:4-2; and
6. Award all further and proper injunctive relief, and all such other relief as permitted by law that this Court deems appropriate.

COUNT IV
UNFAIR COMPETITION, NEW JERSEY COMMON LAW

47. SV Products repeats and incorporates by reference the allegations made in the foregoing paragraphs of this Amended Complaint as if fully set forth herein.

48. This Count is for unfair competition and arises under New Jersey common law.

49. USA Flood has engaged in various acts of unfair competition, including those that are forth in detail in this Amended Complaint. The acts of unfair competition include, but are not limited to, USA Flood's improper reliance on Certificates of Compliance relating to its flood vents that are false and misleading in that they do not comply with the design and performance criteria for engineered openings as specified in TB-1, as amended, and ASCE 24. Further the acts of unfair competition include the literally false and misleading statements made by USA Flood that its flood vents are certified as compliant by FEMA, ICC and NFIP.

50. USA Flood's conduct constitutes willful acts of unfair competition as USA Flood at all times knew that its Certificates of Compliance and its statements concerning the certification of its products by FEMA, ICC, and NFIP are false and misleading.

51. USA Flood has made these false and misleading Certificates of Compliance and statements with the intent of influencing consumers to purchase its flood vents.

52. USA Flood's aforementioned Certificates of Compliance and statements are material in that they have influenced and continue to influence the purchasing decisions of consumers.

53. USA Flood intended to mislead the public for its own commercial gain with the aforementioned false and misleading Certificates of Compliance and statements, at the expense of and causing injury to SV Products, which did not engage in similar false statements.

54. As a direct and proximate result of USA Flood's false and misleading Certificates of Compliance and statements, there is actual deception or confusion, and/or the likelihood of deception or confusion, of the intended audience, namely, the consumers of the flood vents.

55. As a direct and proximate result of USA Flood's above-described acts of unfair competition, USA Flood has gained an undeserved competitive advantage over SV Products by delivering cost savings to customers that are unavailable to customers of an honest practitioner such as SV Products.

56. SV Products has made substantial investments of time, labor, and money to ensure that its flood vents comply with the design and performance criteria for engineered openings as specified in TB-1, as amended, and ASCE 23. As a result of USA Flood's above-described improper conduct and unfair competition, USA Flood has unfairly deprived SV Products of the fruits of its labor.

57. USA Flood has violated well-recognized standards under New Jersey law of fairness and commercial morality in trade.

WHEREFORE, Plaintiff prays for a judgment against Defendant USA Flood and requests that this Court:

1. Award actual damages, incidental damages, and consequential damages as permitted by law;

2. Award treble and punitive damages as permitted by law;
3. Award all of Defendant's profits or gains resulting from Defendant's willful acts of unfair competition;
4. Award interest, attorneys' fees, costs and disbursements as permitted by law;
5. Enjoin Defendant, its affiliates, subsidiaries, officers, directors, employees, agents, representatives, licensees, successors and assigns, and all those acting for and on their behalf, or acting in concert with them from further acts of unfair competition; and
6. Award all further and proper injunctive relief, and all such other relief as permitted by law that this Court deems appropriate.

Respectfully submitted,

Date: November 18, 2011

s/ Anthony J. DiMarino, III
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EXHIBIT A



FEMA, ICC and NFIP State Engineered
Certified Compliant Vents

1.800.USA.1993
www.usafloodairvents.com



EXHIBIT B



US005944445A

United States Patent [19]
Montgomery

[11] **Patent Number:** **5,944,445**
[45] **Date of Patent:** **Aug. 31, 1999**

- [54] **DEVICE AND METHOD FOR RELIEVING FLOODING FROM ENCLOSED SPACE**
- [75] Inventor: **Martin J. Montgomery**, Avalon, N.J.
- [73] Assignee: **Smart Vent, Inc.**, Avalon, N.J.
- [21] Appl. No.: **09/079,611**
- [22] Filed: **May 15, 1998**

Related U.S. Application Data

- [60] Provisional application No. 60/052,819, Jul. 10, 1997.
- [51] **Int. Cl.⁶** **E02B 7/20; E02B 7/40**
- [52] **U.S. Cl.** **405/92; 405/87; 405/94; 52/573.1**
- [58] **Field of Search** 405/87, 92, 94, 405/95, 96, 99, 100, 101, 102; 454/237, 238, 273, 271; 52/573.1, 1, 19, 169.5, 302.1, 473

References Cited

U.S. PATENT DOCUMENTS

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850,441	4/1907	McGinnis	405/92
911,290	2/1909	Burkett .	
2,105,735	1/1938	Hodge	189/71
2,118,535	5/1938	Betts	61/26
2,565,122	8/1951	Cowan	98/118
2,611,310	9/1952	Cowan	98/118
2,754,747	7/1956	Bertling	98/106
2,774,116	12/1956	Wolverton	20/16
2,798,422	7/1957	Bourque	98/87
3,123,867	3/1964	Combs	20/16
3,425,175	2/1969	Gerde	52/169
3,680,329	8/1972	Burtis	62/275
3,939,863	2/1976	Robison	137/357
3,942,328	3/1976	Bunger	405/96

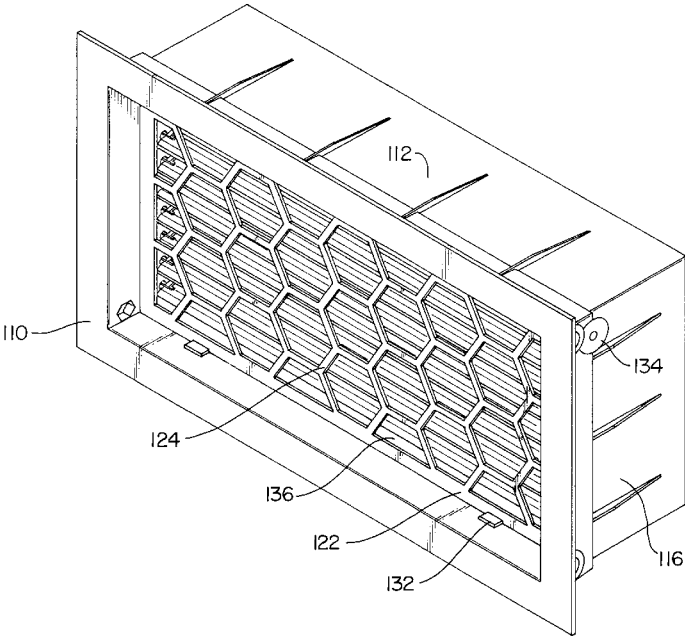
4,116,213	9/1978	Kamezaki	137/360
4,174,913	11/1979	Schliesser	405/94
4,227,266	10/1980	Russell	4/496
4,349,296	9/1982	Langeman	405/99
4,549,837	10/1985	Herbert	405/101
4,669,371	6/1987	Sarazen, Jr. et al.	98/29
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4,699,045	10/1987	Hensley	454/313
4,754,696	7/1988	Sarazen et al.	52/573
5,171,102	12/1992	De Wit	405/100 X
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5,460,572	10/1995	Waltz et al.	454/273
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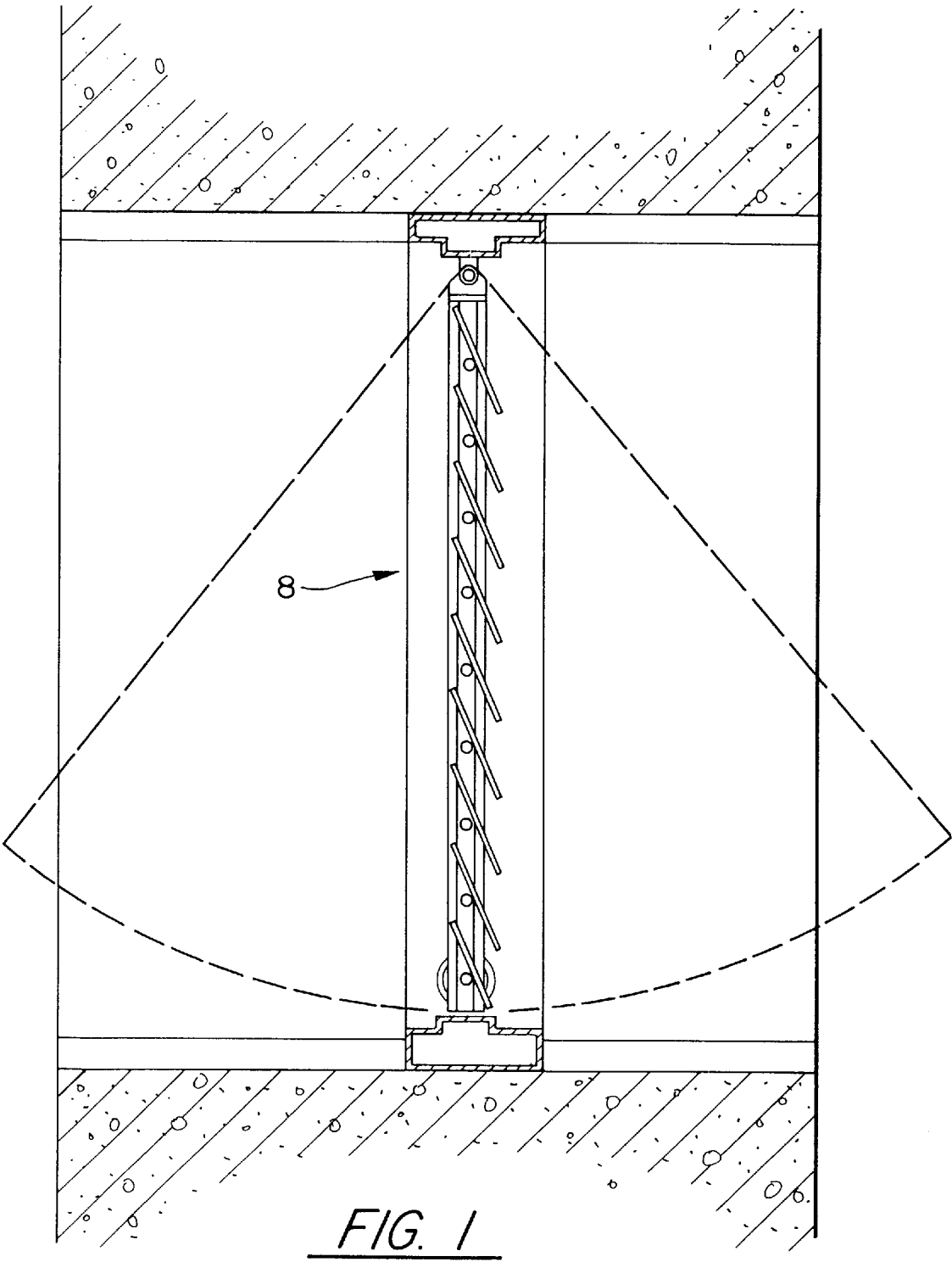
Primary Examiner—Tamara Graysay
Assistant Examiner—Jong-Suk Lee
Attorney, Agent, or Firm—Quarles & Brady

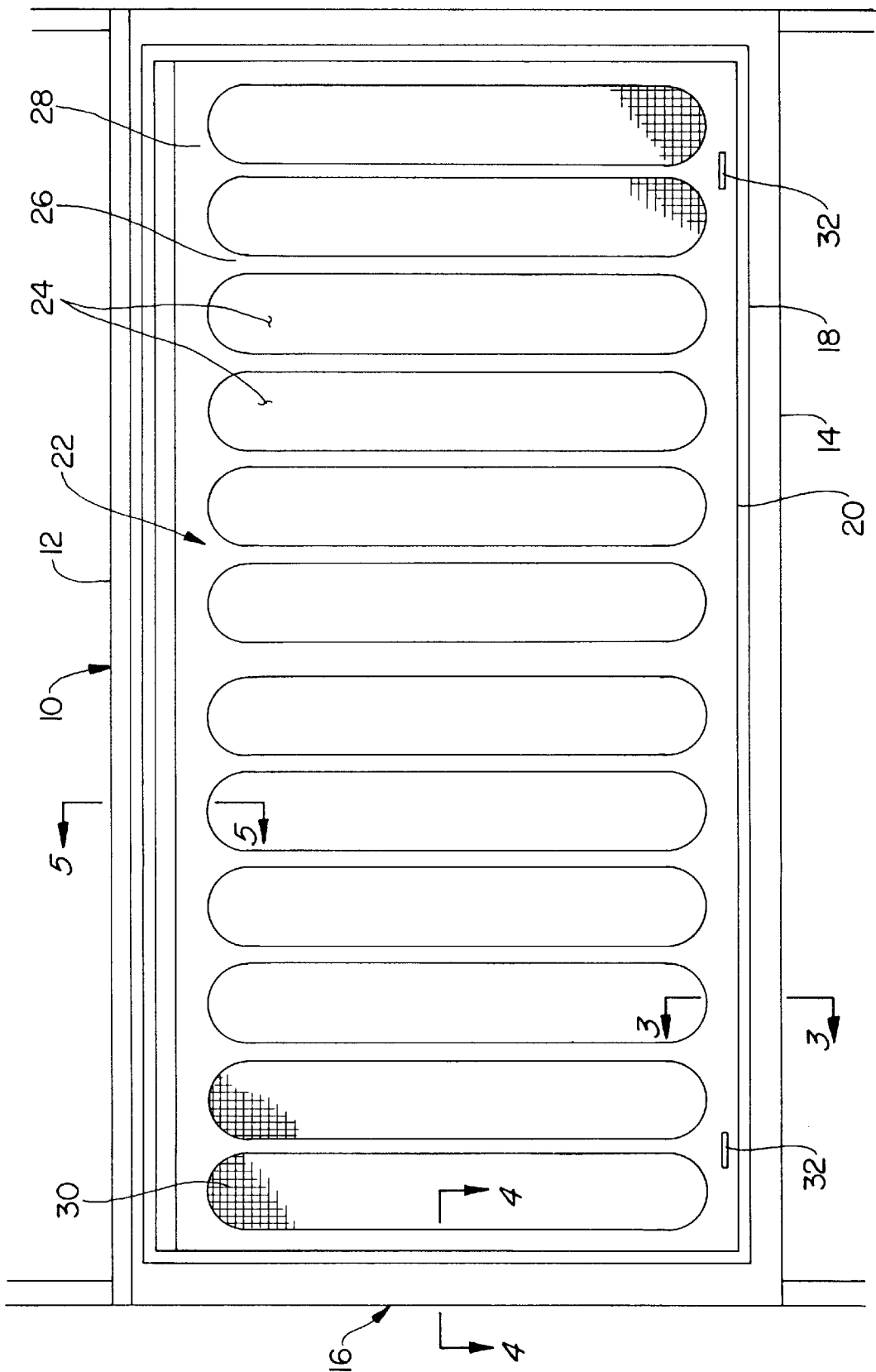
[57] **ABSTRACT**

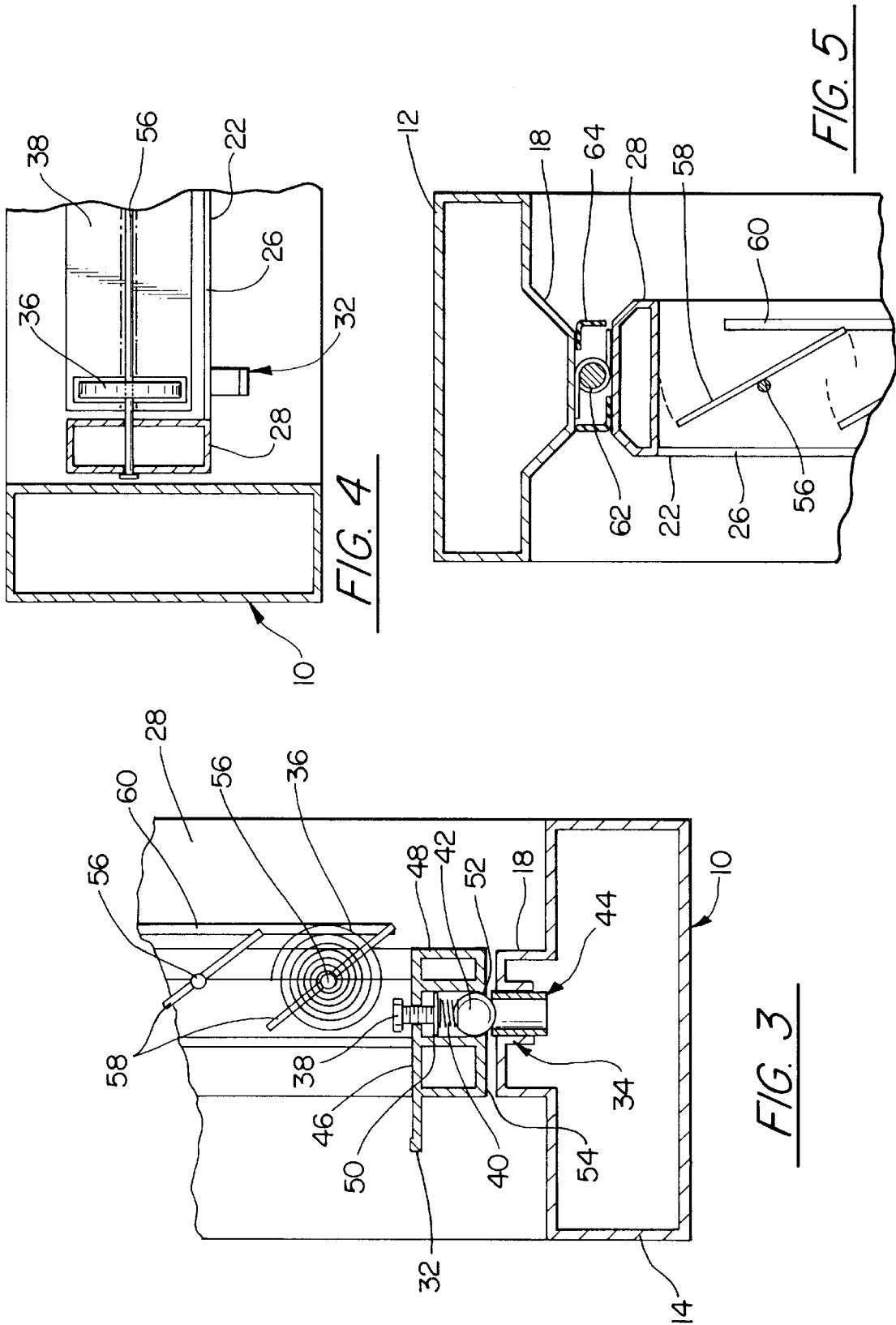
A flood gate for use in a foundation crawl space and the like comprises a frame having side walls defining a fluid passageway therethrough, a door pivotally mounted in the frame for bidirectional rotation between two open positions and a closed position therebetween to permit tidal water flow therethrough, and at least one catching assembly for holding the door in the closed position against a minimum level of pressure of the tidal water flow. Tidal flood waters exceeding the minimum pressure level are automatically vented through the crawl space and the like reducing a risk of structural damage from the tidal flood waters. The flood gate can further comprise a door having a ventilation opening, an automatic louver assembly for controlling air flow through the opening, and a screen covering the opening. The automatic louver assembly opens and closes responsive to ambient temperature.

11 Claims, 8 Drawing Sheets









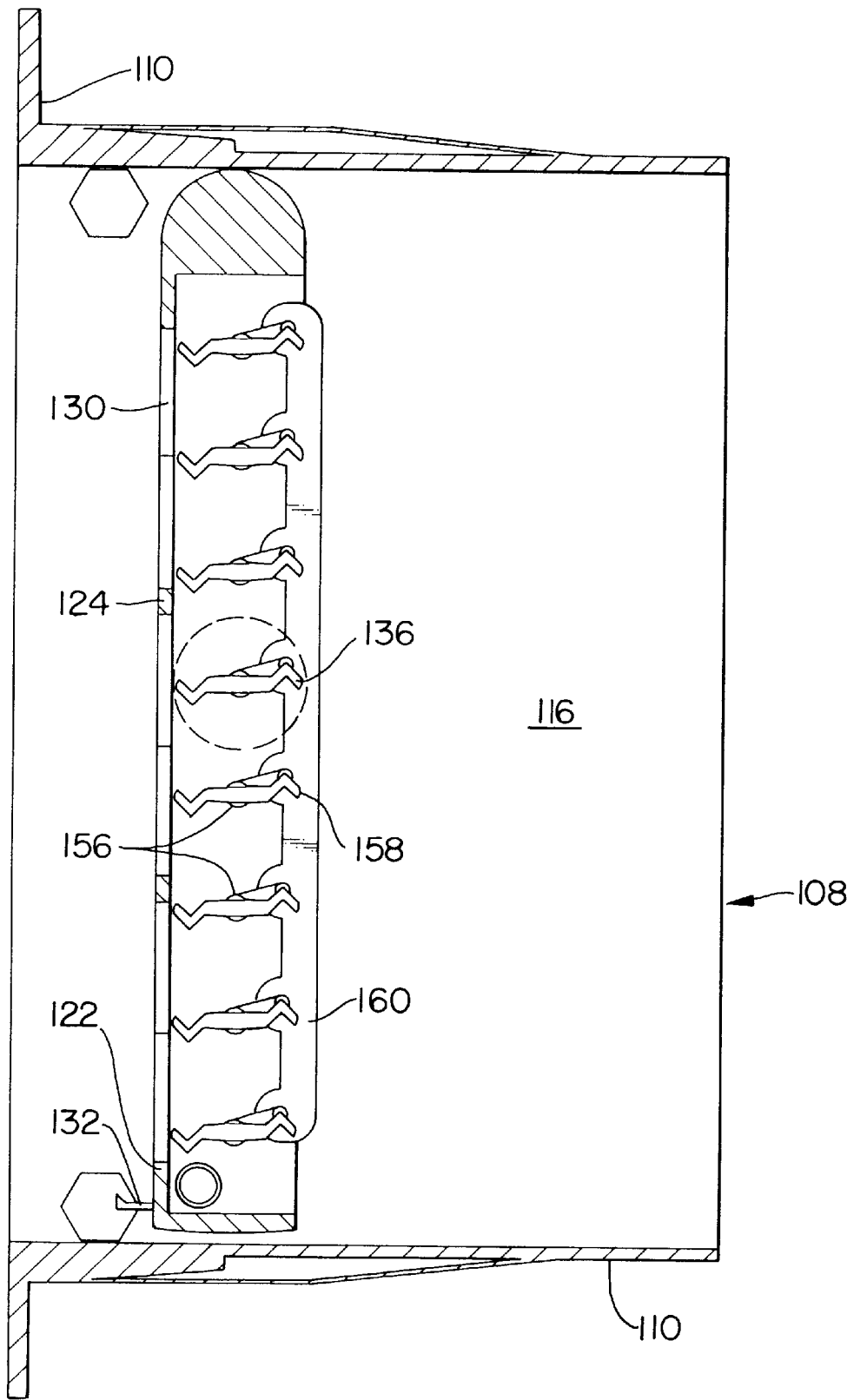


FIG. 6

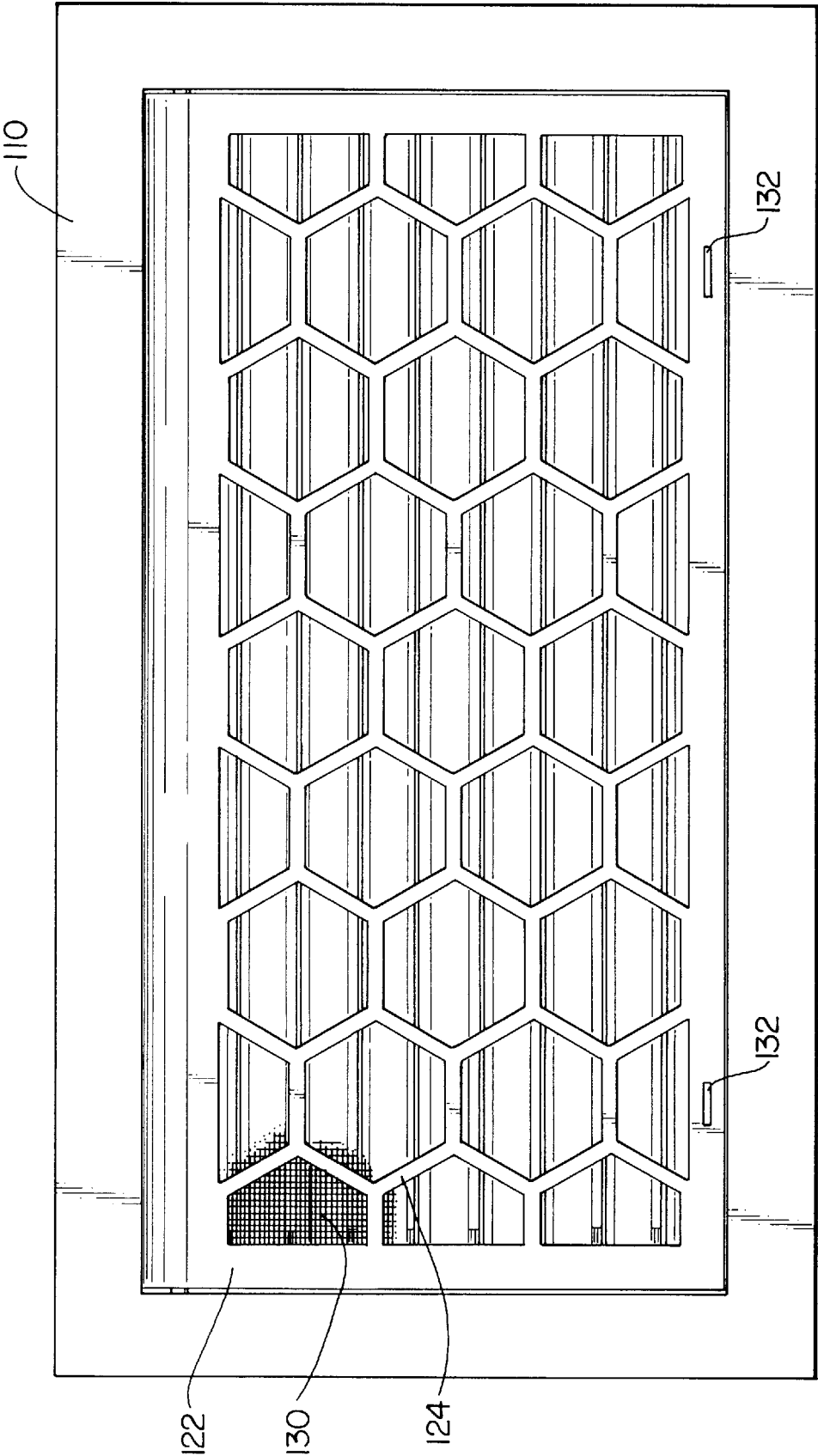


FIG. 7

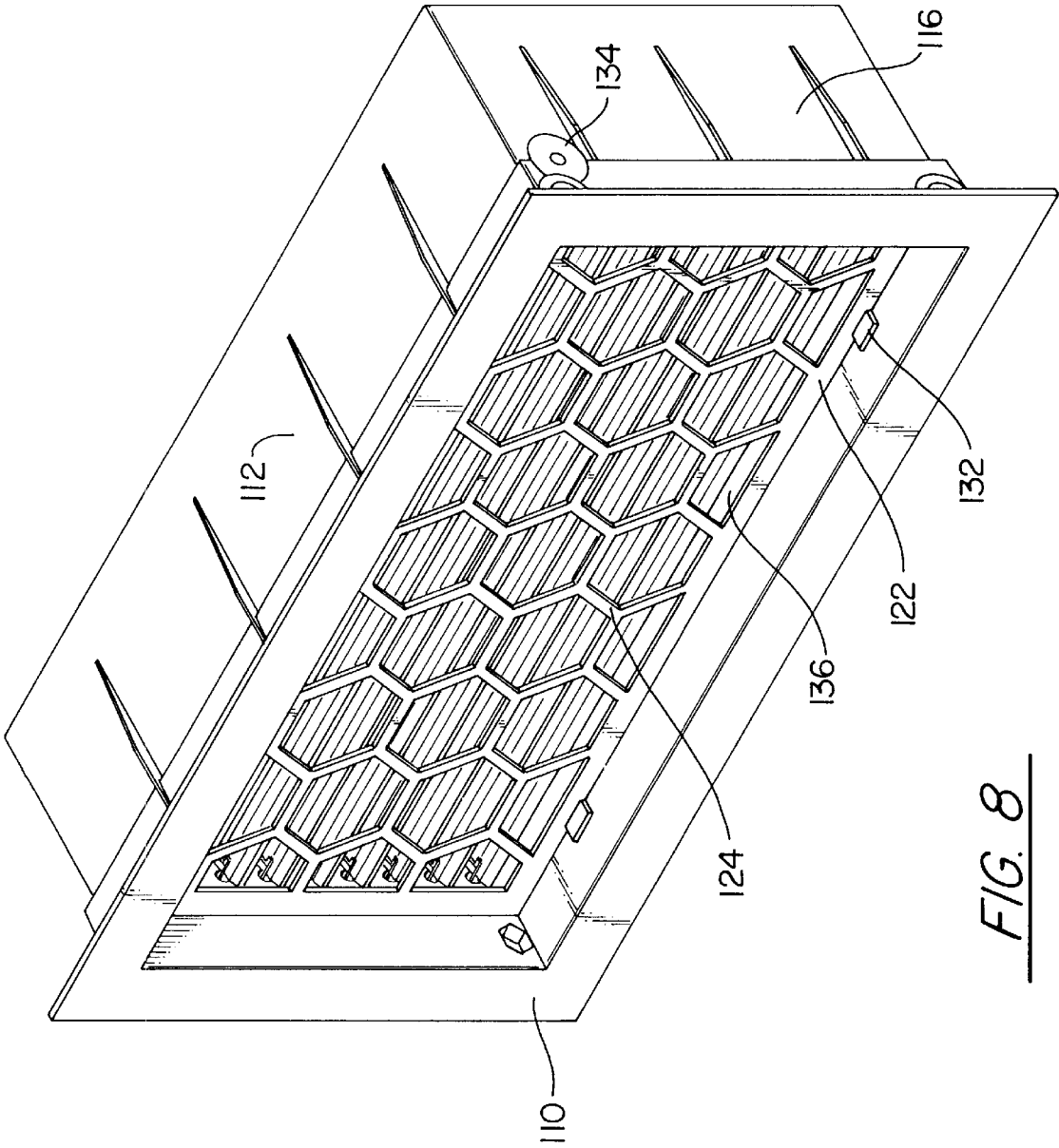


FIG. 8

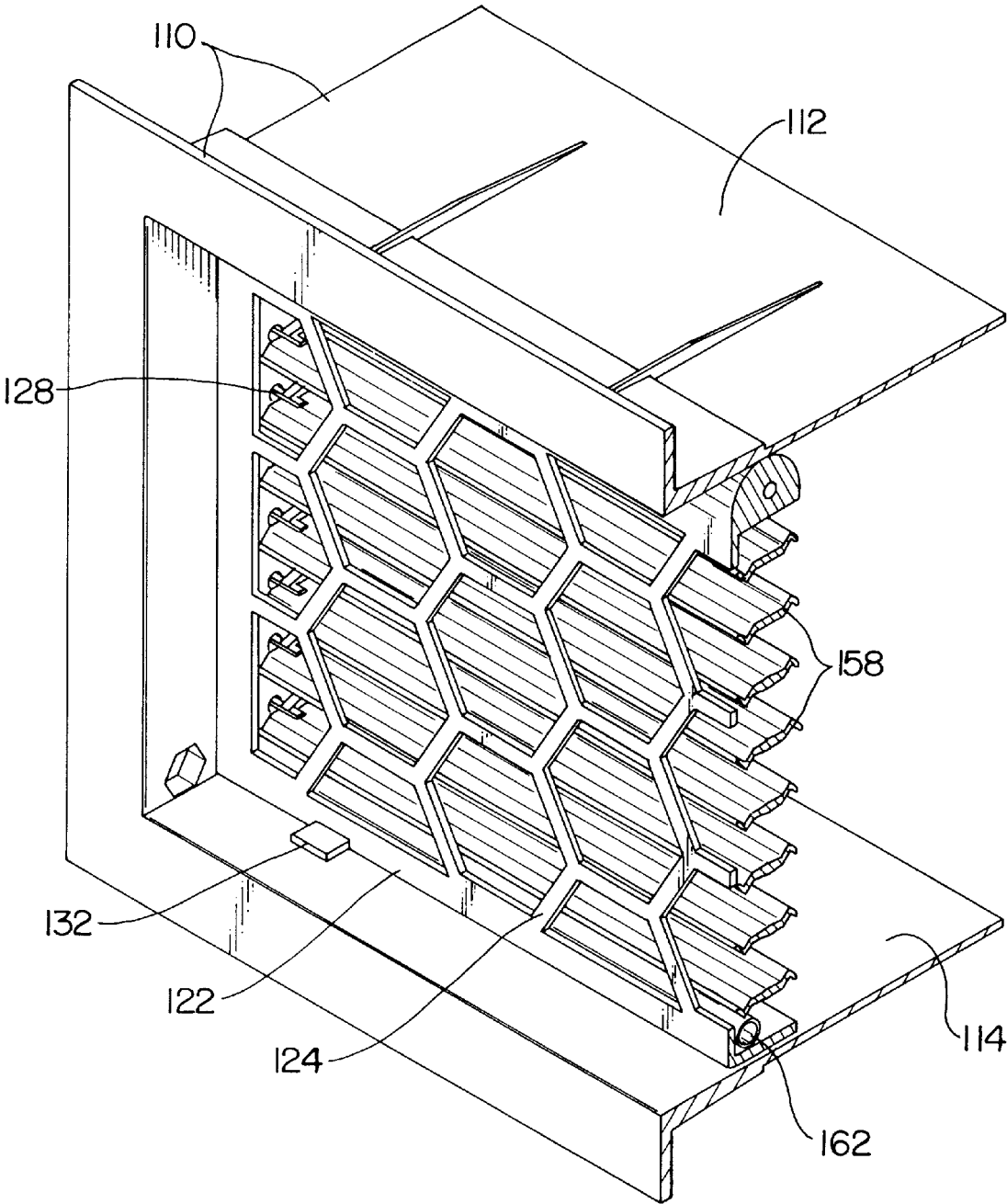


FIG. 9

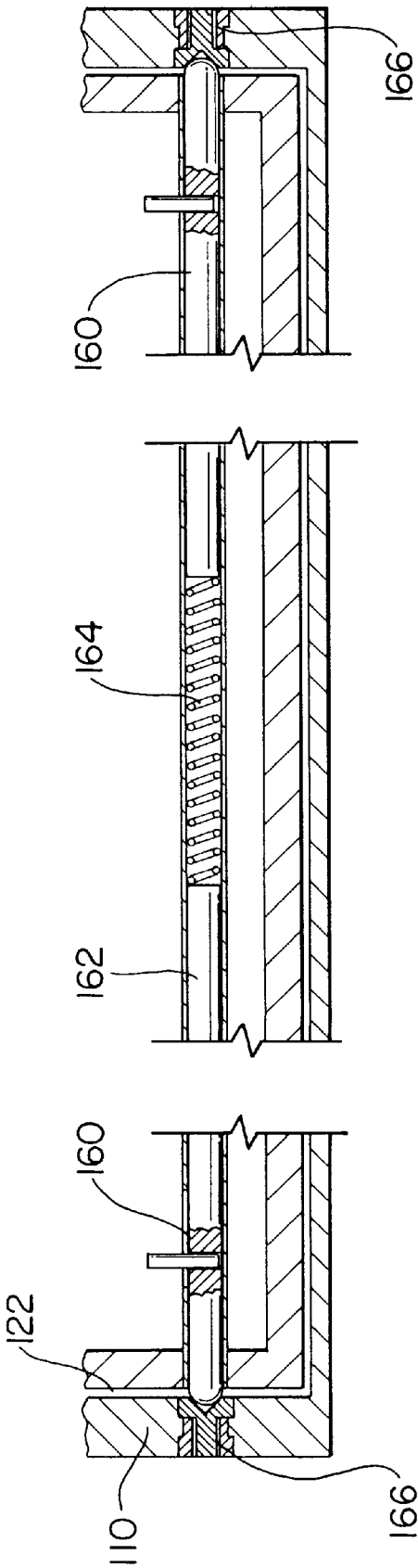


FIG. 10

5,944,445

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**DEVICE AND METHOD FOR RELIEVING
FLOODING FROM ENCLOSED SPACE**

**CROSS REFERENCE TO RELATED
APPLICATION**

This is a continuation of provisional application number 60/052,819 filed Jul. 10, 1997.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to crawl space and base-
ment venting, and in particular, to the flood venting of
enclosed spaces within a foundation.

2. Description of Related Art

Building Officials and Code Administrators (BOCA)
regulations mandate that buildings with subgrade level,
enclosed spaces, such as crawl spaces and basements,
located in low-lying coastal flood areas, provide for
adequate relief from tidal flood waters stemming from
oncoming tides and receding waters. As a solution to the
problem of tidal flood waters, local regulations and good
construction practice employ the use of venting which,
while allowing for tidal waters to ebb and flow through the
enclosed space, the venting does not allow access to small
animals, insects, and other pests through the openings in the
enclosed space. In particular, BOCA regulations require
flood venting for all new construction in low lying coastal
flood areas. Furthermore, BOCA regulations require the use
of flood venting where renovations to an existing structure
exceed fifty percent of the value of the property.

Notwithstanding, good construction practice also
embraces the use of vents which can be opened during
warmer months to allow for air ventilation to permit mois-
ture to escape from crawl spaces, while retaining the ability
to close during colder months to prevent the circulation of
cold air around exposed plumbing in crawl spaces. Thus,
because the use of screening and louvers is necessary to
achieve both the warm weather and cold weather require-
ments of proper venting, a flood vent must be able to
automatically remove the louver and screen barrier when
confronted with free flowing tidal flood water.

Generally, there have been developed a wide variety of
devices which may be utilized to provide pressure relief
from both liquid and gaseous forces. With respect to gas
pressure relief devices, U.S. Pat. No. 3,680,329, issued Aug.
1, 1972 to is Burtis for PRESSURE EQUALIZING VALVE,
disclosed a device to relieve overpressure and underpressure
in the opening and closing of a door of a refrigerated space.
U.S. Pat. No. 2,774,116, issued Dec. 18, 1956 to Wolverton
for DOUBLE ACTING RELIEF VALVE, U.S. Pat. No.
2,798,422, issued Jul. 9, 1957 to Bourque for AIR RELIEF
MEANS FOR DOORS, and U.S. Pat. No. 3,123,867, issued
Mar. 10, 1964 to Combs for VESTIBULE PRESSURE
EQUALIZER related to the equalization of differential air
pressure experienced in the swinging of one door relative to
another door. Finally, U.S. Pat. No. 2,105,735, issued Jan.
18, 1938 to Hodge for PRESSURE RELEASING
APPARATUS, and U.S. Pat. No. 4,116,213, issued Sep. 26,
1978 to Kamezaki for AIR PRESSURE CONTROL APPA-
RATUS FOR A HOT OR COLD STORAGE CHAMBER,
taught methods to release pressure in closed chambers
resulting from changing temperatures within the chamber. In
particular, the Kamezaki apparatus utilized a swinging
damper hinged at the top of an enclosing frame. Neverthe-
less, neither the Kamezaki apparatus nor other

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inventions contemplated the use of a vented damper able to
relieve pressure resulting from fluid flow.

Correspondingly, several devices have been developed
which provide relief from overpressure resulting from the
flow of water and other liquids. U.S. Pat. No. 4,349,296,
issued Sep. 14, 1982 to Langeman for IRRIGATION
DITCH GATE described a gate for an irrigation ditch, which
during normal conditions, through the use of tensioned
springs, maintained flood gates in a closed position, but
upon flood conditions, allowed for the gates to open. U.S.
Pat. No. 3,939,863, issued Feb. 24, 1976 to Robison for
BASEMENT SUMP CONSTRUCTION disclosed a base-
ment drain containing a trap for the prevention of back flow
of flood water. U.S. Pat. No. 4,174,913, issued Nov. 20, 1979
to Schliesser for ANIMAL GUARD FOR FIELD PIPE
related to an invention which, while allowing for the free-
flow exit of debris carrying effluents from an open pipe end,
prevented animal entry into the pipe. Still, none of the
aforementioned devices contemplated the integration of a
liquid flow control device with a temperature controlled
ventilation system.

Presently, several patents disclose methods for ventilating
enclosed foundation spaces. U.S. Pat. No. 5,293,920, issued
Mar. 15, 1994 to Vagedes for LOUVERED BASEMENT
VENT, and U.S. Pat. No. 5,487,701, issued Jan. 30 1996 to
Schedegger et al. for PLASTIC FOUNDATION VENT,
embody louvered basement vents which can be manually
adjusted to limit air flow in colder temperatures, and to
maximize air flow in hotter conditions. U.S. Pat. No. 5,460,
572, issued Oct. 24, 1995 to Waltz et al. for FOUNDATION
VENTILATOR, discloses merely a one-piece molded plastic
foundation ventilator without louvers. The Waltz invention,
however, contemplates the manual use of hinged doors to
regulate air flow through to the foundation. Finally, U.S. Pat.
No. 2,754,747, issued Jul. 17, 1956 to Bertling for AIR
REGISTER OR LOUVER, embodies a hinged, louvered
door, designed to facilitate the maintenance of the screen
behind the louvered door. Nonetheless, the louvers are
designed to be operated manually by the user.

All of the aforementioned foundation ventilators contain
screening to prevent small animals, insects and other pests
from gaining access to the enclosed area. Significantly, none
of the aforementioned foundation ventilators will act as a
water pressure relief valve in response to the ebb and flow
of tidal waters. Furthermore, none provide for the automatic
adjustment of louvers in response to increasing or decreas-
ing temperature so as to prevent either the rotting of the
elements of the structure's foundation, or the freezing of
pipes within the enclosed space. Accordingly, the prior art
has not provided an integrated method to automatically
ventilate an enclosed space of a foundation while allowing
for the relief of liquid pressure on either side of the vent, and
preventing small animals, insects and pests from entering
the enclosed space.

SUMMARY OF THE INVENTION

The subject invention has advantages over all current air
vents now used and provides a novel and nonobvious
opening for the entry and exit of tidal flood waters. The
maintenance free flood vent can be installed in new and
existing crawl spaces and foundations and can remain in use
year round. These vents have particular utility in areas
designated by the Federal Emergency Management Agency
(FEMA) as low lying, flood areas. When installed, the vent
will allow for the free passage of air ventilation in warm
temperatures and the temperature controlled louvers will
close fully in colder temperatures.

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Also, the louvered panel will be screened to prevent penetration by small animals, insects, and other pests and will operate like a pivotally connected gate. The panel can be secured in the closed position through the use of collapsible catches which enable the panel to snap open in either direction depending on the direction of the current of the flood water. The amount of pressure required to open the flood vent is determined by coastal construction regulations, FEMA, and good construction practices and is typically 20 to 25 lbs. as measured when the vents are in the closed position.

A vent in accordance with an inventive arrangement can remain open for regular air ventilation in warm weather conditions, can close to block off air flow during cold weather conditions and can, at any time, snap open to enable the passage of flood water into and out of the crawl space.

A flood gate for use in a foundation crawl space and the like comprises a frame having side walls defining a fluid passageway therethrough, a door pivotally mounted in the frame for bidirectional rotation between two open positions and a closed position therebetween to permit tidal water flow therethrough, and at least one catching assembly, also referred to as a latching mechanism, for holding the door in the closed position against a minimum level of pressure of the tidal water flow, whereby tidal flood waters exceeding the minimum pressure level are automatically vented through the crawl space and the like reducing a risk of structural damage from the tidal flood waters. A flood gate advantageously comprises a door having a ventilation opening, an automatic louver assembly for controlling air flow through the opening, and a screen covering the opening. An automatic louver assembly opens and closes responsive to ambient temperature.

A method for integrating ventilation of an enclosed space and relief from tidal flooding of an enclosed space comprises the steps of: maintaining a vent door in a closed position absent tidal flooding, automatically opening and closing vents in the vent door in response to changes in ambient temperature and opening the vent door in response to sufficient pressure exerted by flood waters during tidal flooding. The automatic adjusting of vents comprises the steps of: automatically sensing ambient temperature, automatically opening the vents in response to warmer ambient temperatures, and automatically closing the vents in response to cooler ambient temperatures. The method can further comprise: automatically biasing the vent door to the closed position, releasably latching the vent door in the closed position, and allowing the vent door to swing open in the direction of the tidal flow.

BRIEF DESCRIPTION OF THE DRAWINGS

Presently preferred and alternative embodiments of the inventive arrangements are shown in the drawings, it being understood, however, the inventive arrangements are not limited to the precise arrangements and instrumentalities shown.

FIG. 1 is a cross section taken along the line A—A of FIG. 2.

FIG. 2 is a front elevation of the alternative embodiment of the invention.

FIG. 3 is a right side elevation of the catching assembly mechanism detail shown in FIG. 1.

FIG. 4 is a right side elevation of the rod connection detail shown in FIG. 1.

FIG. 5 is a cross section taken along the line C—C of FIG. 2.

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FIG. 6 is a cross section taken along the line A—A of FIG. 7.

FIG. 7 is a front elevation of the preferred embodiment of the invention.

FIG. 8 is an isometric elevation of the front panel and frame connection detail shown in FIG. 7.

FIG. 9 is a cross section cut through the midpoint of the isometric elevation of the front panel shown in FIG. 8.

FIG. 10 is a detail section cut through the latching mechanism.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 6 illustrates the flood vent 108 according to the preferred embodiment of an inventive arrangement. In the presently preferred embodiment, the flood vent 108 has an outer frame 110 formed with polypropylene. The dimensions of the outer frame 110 may vary from that of an 8"×16" concrete masonry unit (CMU) to 16"×16", that of two CMUs. Also in the presently preferred embodiment, the top rail 112 and the bottom rail 114 each are 16⅜" long, and the side rails 116 are 8⅜" long.

The outer frame 110 can be secured to a wall opening using stainless set screws as an example. Divots can be drilled in the masonry prior to setting screws to ensure proper security. The perimeter can be caulked as required.

FIG. 7 illustrates the components of the door 122 made with a lightweight, corrosion-resistant material such as molded polypropylene. The door 122 comprises a honeycomb-patterned mesh grille 124 backed by screening 130, for example made from stainless steel. A pair of opposing pull tabs 132 are attached to the mesh grille 124.

FIG. 8 illustrates an isometric view of the front side elevation. The outer frame 110 houses the door panel 122. The smaller door panel 122 connects to the outer frame 110 by pivot points 134 which extrude from the top of the door panel 122.

FIG. 9 illustrates the equally spaced positioning of the finned, polypropylene louvers 158 within the door frame 128. A vertical rod 160, made from a lightweight, corrosion-resistant, strong material, such as polypropylene, couples the finned louvers 158 to a temperature sensitive actuating device 136 mounted on a louver 158 at the midsection of the panel door 122. The temperature sensitive actuating device 136, so named because the device translates thermal inputs into physical motion, is adjusted to drive the finned louvers 158 open during warm temperatures and to fully close the louvers when the temperature falls below forty degrees Fahrenheit.

FIG. 10 illustrates a detail section cut through the latching mechanism. The latching mechanism comprises of two rods 160 and an inner spring 164, inserted into a hollow rod 162 which has been sized to house the rods 160 and spring 164. Both tips of the rods 160 are rounded. The tips extend past the edge of the door panel so as to be received by detent sleeves 166 extruding from both side rails 116.

FIG. 1 illustrates an alternative embodiment of a flood vent 8 according to an inventive arrangement. In the alternative embodiment, the flood vent 8 is framed by an outer frame 10 which is formed with 1" thick by 3" wide strips of a lightweight, corrosion-resistant material such as polypropylene. The dimensions of the outer frame 10 are equal to that of an 8"×16" concrete masonry unit (CMU). Also in the alternative embodiment, the top rail 12 and the bottom rail 14 each are 16⅜" long, and the side rails 16 are 8⅜" long.

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A 1" wide extrusion 18 on the inner surface 20 of the outer frame 10 receives the door 22. The outer frame 10 can be secured to a wall opening using stainless set screws as an example. Divots can be drilled in the masonry prior to setting screws to ensure proper security. The perimeter can be caulked as required.

FIG. 2 illustrates the components of the door 22 made with a lightweight, corrosion-resistant material such as polypropylene. The door 22 comprises a grille pattern 24 defined by a louver panel 26 and a door frame 28 surrounding the louver panel 26. The grille pattern 24 is backed by screening 30, for example, made from aluminum. A pair of opposing pull tabs 32 are attached to the door frame 28.

FIG. 3 illustrates a detailed view of the catching assembly 34 and the temperature sensitive actuating device 36. The catching assembly 34 comprises an adjustable screw 38, a catch spring 40, a ball bearing 42 made from stainless steel, and a threaded sleeve 44. The adjustable screw 38 is threaded through the top surface 46 of the lower door frame 48 into a cavity 50 in the lower door frame 48. The cavity 50 holds the catch spring 40 and the ball bearing 42. An opening 52 with a diameter less than the diameter of the ball bearing 42 is between the cavity 50 and the lower surface 54 of the lower door frame 48. The sleeve 44 is threaded into the extrusion 18 on the bottom rail 14. The adjustable screw 38 varies the compression of the catch spring 40, and the catch spring 40 pushes the ball bearing 42 partially through the opening 52. The sleeve 44 accepts the portion of the ball bearing 42 that extends through the opening 52.

Multiple horizontal rods 56 made from aluminum extend through the door 22 and are attached to the door frame 28. The horizontal rods 56 are equally spaced within the door frame 28. Finned louvers 58 are attached to all of the horizontal rods 56. A vertical rod 60, made from a lightweight and strong material such as aluminum, attaches the finned louvers 58 to a temperature sensitive actuating device 36, SO named because the device translates thermal inputs into physical motion. The temperature sensitive actuating device 36 is mounted on the bottom-most horizontal rod 56, and is adjusted to drive the finned louvers 58 open during warm temperatures and to fully close the louvers when the temperature falls below forty degrees Fahrenheit.

FIG. 5 illustrates a detailed view of the hinging apparatus. A spring-loaded piano hinge 62, for example made from stainless steel for corrosion resistance, rotatably connects the door frame 28 to the extrusion 18 on the top rail 12. The spring loaded piano hinge 62 can rotate up to 90 degrees in both directions. When no horizontal pressure is exerted on the door 22 the spring-loaded piano hinge 62 urges the door 22 back to a substantially vertical position. As the door 22 is urged to a substantially vertical position, the spring-loaded piano hinge 62 must have sufficient force to compress the catch spring 40 which allows the ball bearing 42 to withdraw into the opening 52 such that the ball bearing 42 can pass over the sleeve 44. The spring load is sensitive to 6 to 8 lb. of horizontal force. A front and back flexible weather strip 64 are preferably attached to the extrusion 18 adjacent the spring-loaded piano hinge 62 and to the door frame 28.

What is claimed is:

1. A flood gate for use in an enclosed space, the flood gate comprising:
 - a frame having side walls defining a fluid passageway therethrough;
 - a door pivotally mounted in said frame for bidirectional rotation between two open positions and a closed position therebetween to permit tidal water flow therethrough; and,
 - at least one catching assembly for holding the door in said closed position against a minimum level of pressure of said tidal water flow;

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whereby tidal flood waters exceeding said minimum pressure level are automatically vented through said enclosed space reducing a risk of structural damage from said tidal flood waters.

2. The flood gate according to claim 1, wherein said flood gate comprises:

- said door having a ventilation opening;
- an automatic louver assembly for controlling air flow through said opening; and,
- a screen covering said opening.

3. The flood gate according to claim 2 wherein said automatic louver assembly opens and closes responsive to ambient temperature.

4. The flood gate according to claim 2, wherein said automatic louver assembly comprises:

- a plurality of louvers;
- a temperature sensitive actuating device; and,
- a member connecting said plurality of louvers to said temperature sensitive actuating device.

5. The flood gate according to claim 2, wherein said screen comprises:

- a mesh grille; and,
 - a screening over said grille;
- whereby small animals, insects and other pests are denied access to said enclosed space notwithstanding ventilation of said enclosed space.

6. The flood gate according to claim 1, wherein said catching assembly comprises:

- at least one catch;
 - at least one resilient member; and,
 - at least one detent sleeve;
- whereby the catching assembly can maintain said door in said closed position until said minimum pressure is applied to cause the door to swing into one of said open positions.

7. The flood gate according to claim 1 wherein said enclosed space is a foundation crawl space.

8. A method for integrating ventilation of an enclosed space and relief from tidal flooding of said enclosed space, comprising the steps of:

- maintaining a vent door in a closed position absent said tidal flooding;
- automatically adjusting vents in said vent door in response to changes in ambient temperature; and,
- opening said vent door in response to sufficient pressure exerted by flood waters during said tidal flooding.

9. The method as recited in claim 8, wherein said step of automatically adjusting said vents comprises the steps of:

- automatically sensing said ambient temperature;
- automatically opening said vents in response to warmer ambient temperatures; and,
- automatically closing said vents in response to cooler ambient temperatures.

10. The method as recited in claim 8, comprising the steps of:

- automatically biasing said vent door to said closed position; and,
- releasably latching said vent door in said closed position.

11. The method as recited in claim 8, comprising the step of allowing said vent door to swing open in the direction of said tidal flow.